Mann (M.D.)

Surgical Operations on the Pelvic Organs of Pregnant Women

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Dear Doctor:

I send you, with my compliments, a copy of a paper reprinted from the Transactions of the American Gynaecological Society.

The data on which it is based were collected with considerable difficulty, but are hardly sufficient to settle all the questions involved.

It is proposed to continue the investigation, and to this end I would most earnestly ask your aid. Brief notes of cases bearing on these questions will be gratefully received and acknowledged.

References to published cases, which may have escaped my notice, will also be very acceptable.

Hoping that you will be willing and able to help me in this matter, I am with greatest respect,

Very Truly Yours,

Matthew D. Mann.

SURGICAL OPERATIONS ON THE PELVIC ORGANS OF PREGNANT WOMEN.

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WHETHER or no it be best to operate on a pregnant woman is a question which will often force itself upon the attention of the surgeon. While sometimes the exigencies of the case will make clear his line of action for him, still he is certain to meet with occasions when he will be called upon to decide as to the propriety of operating, and where the nature of his decision will have a most important influence on the welfare of his patient. These occasions, to be sure, are rare; but this very rarity implies want of experience, and leads the surgeon to desire some guide, or some reliable observations, by the study of which he may come to an intelligent and safe decision. If he seeks to be governed by the rules of the books, or by the experience of others, he will find very little written to guide him, and very few recorded observations from which to draw conclusions. It is for the purpose of adding to our scanty stock of knowledge on this subject, and to enable us to deduce certain rules for our guidance in practice, that I have collected the cases here reported.

As the pregnant woman has generally been considered by the operating surgeon as a sort of a *noli me tangere*, the reports of operations performed during this condition are necessarily rare, and the operations are either those done unwittingly or those rendered imperative by the nature of the case. If this be so of operations in general, it is still more so if we limit our investigation to operations involving the

pelvic organs. We then find the material to be very scanty and widely scattered. To collect a sufficient number of cases, I addressed letters to certain prominent gynecologists,[1] asking for the results of their experience, and have been thus furnished with quite an array of cases never before published.

A number replied that they had never met with any cases, and among these were some of our most busy operators. To the cases thus collected I have added some taken from our current literature, and a few from my own experience.

My attention was first drawn to the subject by a case, to be detailed later, in which I repaired a torn cervix, and the woman, to my great surprise, bore twins at full term, about seven months later. This I at first considered a lucky chance, but since I have collected the material for this paper, have somewhat changed my mind. The question of performing ovariotomy during pregnancy presents so many points of a special nature, and has already received so much attention, that its discussion will be put outside of our present limits.

The reasons why operations have been avoided during pregnancy are based on the varied and striking changes which take place in the woman's organism with the advent of conception. I need only recall them to mind. The blood is altered both in its constituents and in its quantity. The red corpuscles become fewer, and the white more numerous. The blood also contains more of water and fibrine, and less of albumen and iron. To accommodate this changed condition of the circulating medium, the heart itself undergoes certain modifications. Its cavities are dilated, and there is hypertrophy of the left ventricle. As a result of the addition to the quantity of the blood, as well as the changes in the heart, we have increased arterial tension. The glandular and nervous systems also undergo very marked alterations.

[1] To the gentlemen who have thus kindly interested themselves in my behalf I wish to extend my sincerest thanks. In many instances I know it involved a great deal of personal trouble, which is fully appreciated.

But it is in the genital organs that we find the greatest changes. With the fixation of the impregnated ovum in the uterine cavity there is renewed activity in the formative processes in all the organs involved in the nourishment and expulsion of the growing fetus. The uterus at once increases in vascularity, and its ultimate fibres begin to grow in every direction. The blood-vessels increase in size and number, while the lymphatics, which were previously small and unimportant, become greatly hypertrophied and increased in number. The connective tissue around the uterus, and in the broad ligaments, is also hyyertrophied and softened. Changes of the same nature take place coincidently in the vagina.

All these metamorphoses, both those in the general organism and those in the special organs involved, would seem to invite accident in the event of an operation. The increased arterial tension, as well as the enlargement of the vessels, and the general softening of the tissues, would all seem to make probable the occurrence of more than the usual amount of hemorrhage, and make its arrest very difficult. The enlarged lymphatics would certainly open the doors to the rapid and easy absorption of septic material, while the quickened cell growth, as well as the increase in the number of white corpuscles in the blood, might lead us to expect a considerable tendency to pus formation.

But above all these *a priori* objections stands out — the great and undoubtedly real one — the danger of interfering with the growth of the product of conception, or, in other words, the danger of producing an abortion. There is little use in arguing about this, for the well-known differences which exist in individual tendencies and predispositions render all of our reasoning vain. As long as one woman aborts from a misstep while her neighbor goes through a severe accident without any interruption in the progress of the utero-gestation ; as long as this is so, — and we are unable to explain the causes of the difference in the results, — so long will we be unable to predict with certainty the results of an operation to be performed on the genitals of a

pregnant woman. But while this must in general be admitted, still, from a careful study of the physiology of the parts involved, and from the consideration of the results already obtained by operators, we may be able to give a certain amount of probability to our prognostications which will enable us to act intelligently in any given case.

In addition to the changes already described as taking place in the uterus, we have the great change due to the presence in its cavity of a growing body. This of course produces a dilatation of the cavity *pari passu* with the growth of the ovum. In this dilatation, however, the cervix takes little or no part. While the cervical tissues increase to a certain extent, the growth is in no wise commensurate with the increase which takes place in the parts above the internal os. By the end of the fourth month the cervix has attained its full size, and thereafter remains unchanged until the beginning of labor. These points, although long contested, are now very generally considered to be settled. With the growth of the cervix occurs that peculiar softening of the tissues, which is so characteristic of the pregnant condition.

It will be seen then that an application may be made, even up into the cervical canal, without in any way necessarily involving the integrity of the ovum; and the same is true of a cutting operation, provided the internal os is not too nearly encroached upon. While this is true in a strictly anatomical sense, the peculiarities of the individual, already alluded to, or, in other words, the susceptibility of the reflex centres, introduce an element of uncertainty. As the uterus is left, the nearer we approach the vulva the less does this element of uncertainty enter into the case, the less danger is there of provoking uterine contractions.

The stage of the pregnancy is also an important element in the question. It is generally well recognized that in the earlier stages, and at the menstrual epochs, uterine contractions are more easily excited, and abortions more apt to occur than in the middle periods. The same is true toward the end of pregnancy, though after the child is viable, its expulsion is a matter of less importance.

Having grouped together the arguments against operating on the genitalia of a pregnant woman, it would be unfair not to give the points which might be urged in favor of the choice of this time for operating.

The greater amount of fibrine in the blood might, by increasing its coagulability, counteract the supposed hemorrhagic tendencies. The increased cell growth might also be thought to favor repair and aid primary union; and also in the case of plastic reparative operations to so aid the growth of the newly-formed connective tissue as to make it sufficiently strong to endure the strain necessarily brought to bear upon it in the labor. These are scarcely arguments, and would not count unless there were other and mightier reasons for choosing pregnancy as the time for operating.

We have then two aspects of the question before us for discussion: The influence of pregnancy on operations in general; and The effect which operations have on pregnancy. First let us see what have been the results of operations on other parts of the body.

The general feeling on the subject is doubtless well expressed by Dr. Priestley when he says: "It is generally supposed that no operation should be performed during pregnancy, even removing a tooth." Paget, however, says that pregnant women bear operations well. Cohnstein concludes, from the consideration of a number of cases, that repair goes on unimpeded, union by primary intention being rare, but suppuration sometimes very profuse. As regards the second question, Cohnstein found that after operations and injuries pregnancy terminated naturally in 54.5 per cent. of all cases. Massot concludes that ordinary surgical operations do not interfere with pregnancy, unless they materially and permanently disturb the uterine circulation, or excite uterine contractions by reflex irritation. Verneuil has observed a great number of traumatic lesions in pregnant women, and considers that temperature is the great factor in determining the results, whatever be the cause of the febrile action; if 40° C. (104° F.) be reached, as a general rule, abortion and death follow. M. Nicaise expresses

the opinion that the nearer the lesion is to the genital organs, the greater is the danger of abortion, an opinion reëchoed by nearly every writer on the subject, and supported by Cohnstein's statistics. In them he shows that of the 45.5 per cent. in which abortion occurred, in 32 per cent. the genito-urinary organs were involved in the operation. In Massot's statistics the percentage of abortions in the two classes of cases are about the same. He collected 214 cases; of these 83 were accidents, and 131 operations. Of the 131 operations, 62 involved the genital organs, and 69 did not. Of the 62, 41 recovered, 66.1 per cent, and 19 aborted, 30.6 per cent. While of the 69 general operations, 47 recovered, 68 per cent., and 21, or 30.4 per cent., aborted.

These, then, are the general conclusions to which previous investigators lead us. As far as operations on the pelvic organs are concerned, they are based on too few cases to be at all conclusive, and fail to lay down any rules for practice. I propose, therefore, to examine all the cases which are accessible, grouping them according to the organs which they involved, and try to draw some practical lesson from their consideration.

OPERATIONS ON THE VULVA.

Abscesses of the vulva are not very uncommon during pregnancy. Cohnstein and Massot have collected a number of cases as follows:—

One case by Grenser, successful.

Two by Verneuil; first case (144),[1] abortion and death; patient was in the sixth month. There was in this case an abscess of the ovary and tube, probably due to the same cause as the abscess of the vulva, namely, gonorrhea. This ruptured into the peritoneal cavity and caused death. There was, however, an angeioleucitis and lymphadenitis starting from the labial abscess, which may have been the cause of the abortion. Second case (146), in seventh month; was successful. Desprès (145), two cases successful. Petit, one case (147), in the fourth month. Spontaneous rupture, re-

[1] Numbers after cases refer to Massot's work.

covery. Five cases in all, with one abortion followed by death. The others healing quickly, and without accident.

Tumors of the Vulva. Cohnstein finds a case recorded by Simon, in which the lower half of the right labium was amputated for a large sarçoma in the second month of the pregnancy. The wound healed rapidly, and the pregnancy was not interfered with, but the sarcoma returned before labor set in.

Dr. Parvin[1] reports a very interesting case, as follows : —

"The patient, about twenty-four years old and pregnant for the first time, was found to have a large labial cyst. The tumor was first noticed at the age of fourteen, about the time of the first menstruation, but grew very slowly until after marriage. When she became pregnant it grew very fast, doubling in size within three or four months. I saw her when about four months advanced in pregnancy ; removed about one third of the cyst wall, — after exposure and evacuation of its contents, — and then filled the cavity with lint. The patient did well, and did not miscarry. The tumor was the size of a large orange."

Dr. Paul F. Mundé sends me the following : —

"A colored woman, aged twenty-four, had borne four children, and had one miscarriage. During her first pregnancy, six years before, she noticed an enlargement of the labia. It subsided after the birth of her child, but during the second pregnancy it again developed. When seen it was of the size of the fist. It involved the nymphæ, clitoris, and labia majora. From being ulcerated it caused a great deal of pain. She was then four months pregnant. In view of the probable rapid growth of the mass (which was recognized as an elephantiasis of the vulva), and on account of the suffering it caused, its removal was determined upon in spite of the known pregnancy. The operation took place June 18. Elastic ligatures were used over three needles, transfixing the tumor transversely. The mass was then excised above the ligatures. There was no hemorrhage. After the removal of the ligatures, a dozen or so spurting arteries were

[1] Dr. Parvin also reports a case of amputation of the breast for cancer, and of the leg for malignant disease, with good results in both cases, and without inducing abortion.

caught and tied, and the wound closed by twelve sutures. Union almost by first intention, except in the tracks of the ligatures, which came away on the tenth day. No interruption of the pregnancy."

A somewhat similar case is reported by Churchill (157). The patient was in the seventh month. The nymphæ and clitoris were hypertrophied, forming three large tumors, the central one being as large as a turkey's egg. This tumor only was removed, by ligatures and excision, three days afterward. The patient recovered perfectly.

Massot (156) quotes from Aubenas an account of a large lipoma of the vulva. It weighed three pounds, was removed, and patient made a good recovery.

Of *Venereal Warts* or *Vegetations* of the vulva, Massot has collected a number of cases.

Velpeau (148), in 1845, removed an enormous vegetation. Considerable hemorrhage followed, and some days after abortion with recurrence of hemorrhage; recovery.

Gailleton (149) reports three cases where he removed vegetations unwittingly during pregnancy; two of his cases miscarried.

Chassaignac (150) had a case where, after trying acetic acid and Vienna paste, he used a great number of ligatures. The patient was five months advanced, and made a good recovery without miscarriage. In a second case (151) at the third month he used the linear écraseur with satisfactory results; no hemorrhage or abortion.

Demeaux (152) met with a case where the vegetations, in two masses, reached from the mons veneris to the perineum, each one as large as a man's fist. The operation was performed in the fifth month, the tumors being excised and the hemorrhage stopped with difficulty with perchloride of iron. The hemorrhage recurred in the night, and again the next day. The wound was all healed on the eighth day, and the patient was finally delivered at term.

Demeaux (153) also operated on a mass as large as a fist. The patient recovered quickly and went to term.

Desprès (154) reports a case of a "*bouquet de végétations*"

as large as the head of an adult. The patient was twice operated upon when in the fifth month; hemorrhage was considerable, but she recovered and went her full time. He reports also (155), that he has removed very large vegetations from six patients, being from three to seven months advanced. All were primiparæ, and from seventeen to twenty years of age. None of them aborted.

Violet and Tilleaux also report two cases each, in which they removed large vegetations without accident. Total, nineteen cases of vegetations of the vulva, with three miscarriages. Unfortunately, of the cases which miscarried we have no details.

Here we have twenty-eight cases in which operations of more or less severity were performed on the vulva, and in only four instances were there any bad results; the others recovered without interruption of the pregnancy. As has been already said, one of the fatal cases was so from complications not connected with the operation.

THE PERINEUM.

The operation of *Perineorrhaphy* is so very common that it is not at all surprising that a certain number of operations performed during pregnancy are reported. Dr. Goodell met with two cases, one three months pregnant. She went to term, and, by making bilateral incision, he saved the raphe. The other went to term, but the effect on the restored perineum is unknown. He noticed a good deal of hemorrhage during both operations.

Dr. J. R. Chadwick sends a case as follows:—

"The patient was one in the country, whom I had never seen before. Two weeks later, after she had suffered from severe abdominal pain, I was hastily summoned, with the information that the operation seemed to be a success, but that the attending physician had that morning discovered something resembling a sloughing coil of intestines protruding from the vulva. This he had carefully pushed back. On uncovering the woman I found a two and a half months' fetus hanging by the navel-string. I have since learned that, in extracting the placenta, a part of the united perineum was torn out."

Dr. G. R. Shepherd, of Hartford, Conn., sends me the following very interesting case : —

"Mrs. A., aged twenty-eight, mother of two children, sustained a double laceration of the cervix in her first confinement, the perineum being also torn completely through the sphincter. The extent of the injury was recognized at the time, but no immediate surgical measures were adopted beyond confining the knees with a bandage, and consequently her second pregnancy, at the expiration of fourteen months, found her with the lips of the uterus widely separated and everted, though entirely covered with healthy mucous membrane. The sphincter ani was unable to retain either flatus or moderately fluid evacuations. She did not miscarry with her second child, but was confined at full term. Six months later she presented herself for operation upon the cervix. Menstruation had recurred, though irregularly, during her second lactation, and consequently I found it impossible to know just when to expect it ; but as her stay in the city was necessarily limited, I operated on the 20th of September, 1881, a little over six weeks from the last menstrual period. Pregnancy not being suspected, the uterine sound was carried to the fundus at the time of the operation, and again two weeks later, when the stitches were removed. The nausea and vomiting that followed the operation were very annoying, and continued to recur every few days for two or three weeks after the removal of the stitches. Her breasts began to enlarge and became sensitive, and, when I decided to operate upon the perineum on the 18th of October, she was feeling quite confident (and I very strongly suspected) that she was pregnant."

"Both operations were successful, and pregnancy progressed without interruption. She left for the West in November. Her husband, a physician, watched her carefully, and wrote me, after the period of quickening, that he expected her confinement early in May, 1882, and stated that in her condition it was a great comfort to have the complete control of her sphincter, which the operation had given. In March she decided to return East for her confinement, but while on the way was attacked with pneumonia, and died at Montreal. I observed no greater care in this case than is my custom, and noted nothing at the time of the operation that was at all unusual. Regarding the question of hemorrhage, I can simply state from memory that, if anything, there was less than usual, though not markedly so."

It may be objected to this case that it is not a fair one to draw conclusions from. A woman who, while pregnant, could bear the passage of the sound to the fundus on two different occasions could hardly be made to abort.

Dr. Reamy gives the history of two cases as follows: —

Case I. — Mrs. F., aged twenty-eight, mother of two children, the youngest thirteen months old. During her first labor she suffered a laceration of the perineum, dividing the external sphincter, but not the recto-vaginal septum. She consulted me March 1, 1879; was then suffering from the symptoms usual after such an accident. Deformity of the vaginal entrance very marked, also considerable prolapse of the posterior vaginal wall. Vaginal contractility much impaired, greatly annoyed by the escape of wind from the vagina, especially when lying upon the side. Uterus slightly prolapsed; slight erosion of os. Much mental depression. Perineorrhaphy decided upon. Operated April 3, 1879; five sutures removed on the eleventh day; results perfect. At the date of the operation menstruation, which, had been quite regular for several months, was due in fifteen days. It did not, however, appear, and time proved that she was pregnant. She was delivered January 5, 1880, of a healthy child — weight, nine pounds — without any laceration of the perineum. I obtained from her and her husband the following facts: Previous to the operation, her child had been weaned three months. Her husband had been absent during the three weeks immediately preceding the operation, arriving at home April 1. Connection took place on the nights of the 1st and 2d; the operation was on the 3d of April. Intercourse was not again had until six weeks subsequently. The child was born two hundred and seventy-four days from the date of the operation. Consequently, insemination, if not pregnancy, occurred before the operation was done.

While this can hardly be called an operation during pregnancy, still it illustrates very forcibly the strength of the new adhesions formed during this period, there having been no rupture of the new perineum, notwithstanding a nine pound child.

Case II. — Mrs. G., aged twenty-four, mother of one child two years old, came under my care in January, 1881. She was two months advanced in pregnancy, and was reduced to a mere skel-

eton, having vomited daily, often as many as twenty times a day for the past month. She was of the poorest class, and consulted me at the Good Samaritan's Hospital. The perineum had been torn at her labor through the anal sphincter, the rent in the bowel extending half an inch, but the internal sphincter was, of course, not totally destroyed. Her condition, however, had been miserable, for, as she was compelled to wash for a living, uterine prolapse, with all its concomitants, had occurred. Pessaries had proved to be of no use. At the examination I found the os protruding slightly beyond the external vulvar wall, considerably eroded, with some leucorrhœa. As she could not leave her family to enter the hospital, I determined to operate at her home. After keeping her in bed but one week, with the hips elevated and daily applications of cotton pessaries saturated with glycerine, carbolic acid, and tannin, the condition was so far improved that I operated, doing my own modification of Emmet's operation for restoring the perineum in cases involving the bowel. Vomiting ceased within twenty-four hours after the operation. The sutures were allowed to remain fourteen days. The result was perfect. She was kept in bed for three weeks after the removal of the sutures. The uterus was supported by a hard rubber bow pessary until the fifth month of gestation, when it was no longer needed. Vomiting never returned, and her general health became good. I delivered her of a male child weighing nine and a half pounds, August 21. There was very slight laceration of the perineum, of no importance. It was due to the fact that I had carried the base of the perineal body very far forward in the operation for its restoration.

This case not only shows the harmlessness of operating on the perineum during pregnancy, but it also gives us an indication for operating, and, like the previous case, illustrates the behavior during labor of a perineum only six months old, and made during pregnancy.

The late Dr. J. C. Nott met with a case of which the following is an abridged account: Mrs. L., aged thirty-seven, excessively fat and very short, general health very poor, two children, the last twelve years before. At that time the perineum was torn down to the sphincter ani. When seen she had not menstruated for eight years. The uterus

was very small, the uterine sound passing only two inches. A large cicatrix over the perineum was in a state of *extreme hyperesthesia*. Following two sponge tents a slight bloody flow occurred, but was not repeated. Four months later the perineum was operated upon, Drs. Sims and Thomas assisting. Pregnancy unsuspected. But Dr. Nott says: "Even if I had suspected pregnancy, I think the operation would have been justifiable, as her general health demanded relief, and it was clear to my mind that she could not, in her condition, carry a child to term." Union was solid, and the soreness and morbid sensibility disappeared. "Has not felt so well for years." Two months after the operation she aborted. Dr. Nott was charged with ignorance and malpractice in this case, because he did not know that she was pregnant, and because he operated during pregnancy. The experience of later operators, already detailed here, fully justifies Dr. Nott, when he says: "Although I would not have performed the operation without a consultation if I had been aware of pregnancy, still I believe her case to be a strong exception to the general rule forbidding it, and would unhesitatingly have advocated the operation." With the results now before us it would hardly be necessary to call the consultation. The occurrence of the abortion at so late a date after the operation could not possibly have been attributed to its effects. Dr. Sims, in speaking of this case, declares that he has repeatedly performed the operation on pregnant women, and would not have hesitated here for a moment.

In Dr. Chadwick's case there is no certainty that the abortion depended on the operation on the perineum. Although Dr. Chadwick does not state it, there is a possibility that he passed the sound, and that the abortion was due to that fact.

These six cases, if we throw out Chadwick's, are strongly in favor of the harmlessness of operations upon the perineum of a pregnant woman, should the occasion arise. All that were delivered seem to show that we may expect the newly-formed perineum to successfully withstand the

shock of labor. Dr. Reamy's second case and Dr. Nott's case both give indications for the performance of the operation during pregnancy.

VAGINA.

Venereal Warts in the vagina as well as on the vulva occurring during pregnancy are apt to increase very rapidly, and may be so numerous as almost to be a cause of obstruction during labor. The first case of the kind I ever saw I treated with palliatives, astringents, etc., being fearful of serious results if I attempted to remove the growths. Later, however, emboldened by the success of my operation on the cervix of the pregnant uterus, I determined to operate. A young woman who had acquired gonorrhea shortly after being impregnated for the first time offered an opportunity. My reasons for operating were, that the warts were so numerous and large as to almost block up the vagina. I found it impossible to cure the gonorrhea while the warts were there, and feared that if left until labor set in, the distensibility of the vagina would be interfered with, and that the advancing head would tear off the growths, leaving open the mouths of the lymphatics and blood-vessels, by which the absorption of septic material would be favored. I feared also for the child's eyes, if the infective discharges were left, and also that the disease might extend into and through the uterus, producing a pelvic peritonitis. I had no difficulty in scraping out the growths with the curette and my finger. The hemorrhage was rather free, but was readily checked by introducing a large cylindrical speculum, and painting the whole vaginal surface with a forty-grain solution of nitrate of silver. A few other applications of silver were made in the same way, and the patient was entirely cured, and went through her confinement without difficulty.

Dr. Chamberlain, at a meeting of the New York Obstetrical Society (April 19, 1881), spoke of having seen extensive venereal vegetations removed, under very similar circumstances, from the vulva and vagina without bad results.

Hildebrandt mentions a case by Levy, of Munich, where, after removal of the warts, he cauterized the base with nitrate of silver, and washed out the vagina with lead water. The patient made a good recovery, but four weeks later there appeared on various parts of the body numerous wart-like excrescences, which remained until delivery, and disappeared soon after. Hildebrandt declares that he has frequently seen these growths disappear during the lying-in period, with cleanliness and rest; but for the reasons already given I should prefer to remove them at once.

The cases detailed here, together with those already mentioned in speaking of operations upon the vulva, in which the same indications exist, would seem to offer basis enough for such a conclusion.

Applications. — For the relief of the very troublesome discharges which sometimes cause a great deal of annoyance during the later months of pregnancy, and which I have considered as due in part, at least, to increased vaginal congestion and exudation, I have a number of times used nitrate of silver solutions in the way already indicated, with only good results.

Of *operations on the vagina* proper there are not many to report. Cohnstein remarks that he has never seen any bad results follow the puncture of small cysts in the vaginal walls. Dr. Protheroe Smith mentions having punctured an abscess as large as an orange in the posterior vaginal wall, at the sixth month of pregnancy, without bad results.

Dr. Bixby sends me the report of a case of vaginal polypus: —

"The tumor was nearly as large as a fist. The subject a stout, full-blooded woman. Notwithstanding the employment of an écraseur, the hemorrhage required the tampon. I saw the case in consultation. A few days later I learned that she had miscarried at the third month, greatly to my surprise, as I had not the faintest suspicion of pregnancy. Others had seen her before me, and possibly for differential diagnosis the uterine sound may have been used. She made a good recovery."

It is too bad that some of the conclusions to be drawn

from this case are invalidated by the uncertainty as to the passage of the sound. This applies to many of my cases, as in very few of them was the pregnant condition suspected. Massot has collected a number of cases of this sort. One (158) was an obdurator hymen, cut in the third month, without any bad results. He has collected also three cases of polypus of the vagina. The first (160) was a woman aged twenty-three, in the seventh month of pregnancy. The tumor was outside the vulva, but was attached by a long pedicle to the posterior wall of the vagina; it was much larger than a hen's egg. It was tied, and cut on the fourth day afterwards. Recovery complete. The second case (161) was in Dr. McClintock's practice in 1857. Woman in the ninth month of pregnancy. Tumor attached to the posterior wall of the vagina. It was the size of a small hen's egg, and was sloughing. It was removed, and the patient returned home. Labor came on in a month after the operation, and the patient died in thirty-four hours, apparently of what we would now call septicemia. There was an ulcer on the posterior wall of the vagina, where the tumor had been. The third case (162) was six months pregnant. The tumor was attached by a large, firm pedicle to the anterior wall of the vagina, and was the size of a duck's egg. The pedicle was tied, and the tumor cut off. She recovered, and was delivered at term.

Dr. C. C. F. Gay, of Buffalo, kindly sends me a reference to a case published by him, with notes of the subsequent history of the case. Mrs. G., aged thirty-five, had had procidentia complete for thirteen years; had had five children, three of them since the occurrence of the procidentia. The os protruded two and a half inches beyond the vulva. She was operated upon in June, 1871, according to Emmet's method for narrowing the anterior vaginal wall. Union was perfect, and the patient relieved of her prolapse. Seven months later she was delivered of twins, at full term, one dead and one living. Dr. Bartow, who attended her, is under the impression that the newly attached tissues were torn apart at the labor. In 1876 she was seen

by Dr. Bartow, and the procidentia was found to be as bad as ever.

If stenosis of the vagina, due either to bands or a circular stricture, is discovered during pregnancy, Cohnstein advises that they should at once be cut with the probe-pointed bistoury, and says that no harm is likely to come of it. Verneuil's case, to be related later, leads to a rather different conclusion. At a meeting of the New York Obstetrical Society, Dr. F. Barker related a case where the most marked cicatricial contraction of the vagina gave way, and easily dilated before the advancing head. This would seem to show the uselessness of operating in such cases before labor sets in. Dr. Campbell's second case of vesico-vaginal fistula bears upon this point, and corroborates Dr. Barker's views. He writes of this case: "This rapid softening and stretching of nodular tissue (cicatricial) in the vagina on the occurrence of labor I think I have seen remarked upon by authors, though I cannot recall by whom. Occlusions of the vagina from inflammatory and traumatic causes are, I think, far more common in the African race than in the white. I have had many cases in negro women, and none in white, except in connection with a vesico-vaginal fistula. I was requested to operate on a favorite servant of a planter for occlusion of the vagina, many years ago. She was pregnant, and the operation was thought necessary to admit of safe delivery. She was taken in labor at term, and was delivered without difficulty, and so rapidly that the physician did not arrive until it was over. If there be a congenital atresia the case would be different, and might call for an earlier operation. Herzfeld reports a case, but the atresia was only discovered two weeks before labor, and was left until labor began, when it was torn with the fingers and the forceps applied.

Of seven operations on the vagina, only one resulted in an abortion. The result in Massot's second case is hard to explain, and it is difficult to say how much the old ulcer had to do with the fatal result. Hemorrhage seems to have been the principal difficulty, but in only one case (Bixby's)

was it severe. The method of operating in the other cases of tumor (ligature) may have had something to do with the results obtained.

Vesico-vaginal fistula operations during pregnancy make rather a bad showing. Dr. H. F. Campbell, of Georgia, reports to me two cases operated upon unwittingly in the second and third months of pregnancy, as follows : —

Case I. — I was requested to operate upon a case of vesico-vaginal fistula in a colored woman (mulatto), aged thirty. She had had several difficult labors, but had not borne a living child. In her last labor forceps had been used, late in the protracted labor, and it was after this parturition that the fistula was observed. Bozeman's operation was performed, by which a considerable opening was perfectly closed. The hemorrhage was very severe, and much trouble was experienced in arresting the flow, to effect proper approximation. This was explained some five or six weeks after, when quickening took place, and the woman was found, unexpectedly to herself and to the physicians, to have been pregnant at the time of the operation. I do not remember any symptoms after the operation simulating labor pains, or pains threatening abortion. Being unaware of her condition, if such symptoms occurred they were not recognized.

Dr. Joseph A. Eve, who had charge of the case, had determined, in view of the woman's contracted pelvis and her uniform dystocia, to practice induced labor at the seventh month. It is my impression that spontaneous premature labor occurred at a viable period, and the woman was safely delivered, for the first time, of a living child. She did well after that labor, but died after a subsequent one, at full term, in childbed.

Case II. — Mrs. J. was the subject of a vesico-vaginal fistula, with considerable opening, near the *bas fond* of the bladder. The accident resulted, I have no doubt, from delay in applying forceps when imperatively demanded. I failed in my first operation on account of fibrous bands distorting the vagina and dragging on the line of union. Only a small portion of the fistula remained open. After some six months or more, she returned for a second operation. I found the vagina still imperfectly prepared for the operation, the obstructing bands being a little less troublesome than before. Being apparently in the best of health, and in good condition otherwise, as I thought, for the operation,

I concluded to attempt the closure of the fistula. The ordinary operation, with silver-wire sutures, was performed. The bands were relieved by incision and stretching. Much troublesome bleeding attended every step of the operation, in contrast with the former one, in which no very serious hemorrhage had taken place. This we attributed, at the time, to the free incision of the constrictions. The sutures were finally satisfactorily applied, and the patient put comfortably to bed, with Sims' catheter in the bladder. Before we left the house, she began to complain of great distention of the bladder. Though bloody urine had flowed freely through the instrument, there was no blood in the vagina from the incisions; and not suspecting any unusual hemorrhage, we attributed her discomfort to other causes than distention of the bladder with blood. Returning some two hours afterward, we found the patient in an alarming condition. She complained of distention more than ever. She was extremely feeble, pulse almost imperceptible, skin cold and clammy. She was nauseated, and had vomited frequently. There was a large quantity of blood in the urinal, with but little or no urine. The vagina was filled by the distended bladder, which projected as a tumor at the hypogastrium. We made efforts at breaking up the clots, with the view of washing out the bladder, but the process was too slow and uncertain, in view of her low condition and the probable continuance of the hemorrhage into the bladder. The sutures were therefore removed as rapidly as possible, and the finger introduced into the bladder through the fistula, and the clots broken up and washed out with fresh warm water, and then iced water was used against the bleeding. So low was the patient that I did not dare to leave her, even after the bleeding had apparently ceased, without means to secure her against further loss of blood. Pledgets of lint, soaked in moderately strong solutions of Monsell's salt, were passed from the vagina through the fistula into the bladder, packing and distending the opening so as to compress the cut edges. She made a good recovery, and returned home. Though not suspecting it at the time, Mrs. J. must certainly have been in the early period of pregnancy. Shortly after returning home she felt motion. Refusing induced abortion, she was allowed to go to full term, and returned to Augusta to be delivered, by Dr. Eve and myself. I knew the vagina was terribly obstructed by the fibrous bands and adhesions, and I had a helpless horror of the approaching event, — catas-

trophe, as I considered it. Labor came on suddenly, and she sent for Dr. Eve and myself, at the same time. We had expected a most protracted and difficult obstructed labor: first, because the former labor had required forceps; and secondly, because of the occluded condition of the vagina. When I arrived, Dr. Eve was already on the ground, but, with all his readiness, he had failed to be "in at the birth," which it seemed to me was likely also to be the death. Labor had been accomplished with the most fearful suddenness. We found the woman almost dead, — cold and pulseless, as if after a most exhausting hemorrhage. We found that she had not bled excessively, and we both came to the conclusion that her condition was the result of shock, dependent on the rapid labor, under circumstances so adverse, namely, the condition of her vagina and the existence of the fistula.

The patient recovered, but the fistula remains unhealed. This is certainly a most remarkable case. It is contrary to the general expectation that such a hemorrhage should not have resulted in an abortion, nor should we expect so precipitate a labor in a vagina so constricted as this must have been.

M. Verneuil reports a case of a strong, robust country woman admitted to the hospital in November, 1875. Her last labor was eighteen months before, and since then she had suffered from a vesico-vaginal fistula. There was a sort of diaphragm across the vagina. As this was quite thin, he tore it with the aid of a speculum and his fingers. Two or three days later there was edema of the labia majora. The vagina was congested, with abundant bad-smelling secretion. Vulva very tender and swollen. She was ill three weeks. On her recovery she insisted upon an operation. This was done January 12th, five sutures were introduced, and all went well until the third day. Then there was a slight bloody discharge, which soon became a hemorrhage, with large clots, and an ovum of the second month was expelled. Stitches were removed January 16th. Union complete, notwithstanding all. Verneuil remarks that the case shows both the danger and the harmlessness of pregnancy in its effects on operations.

W. Schlesinger met with a case in which the woman had been delivered six months before, by craniotomy, with the result of a large vesico-vaginal fistula. She had not menstruated since confinement, but denied pregnancy. The cervix was greatly diseased, and, owing to the position of the fistula, was much in the way, bleeding profusely at the prick of the tenaculum. While the stitches were being put in, a great amount of edema of the cervix and vaginal walls was developed. The operation lasted an hour, and was completely successful. The patient remains well, having gone through her labor at term without difficulty. She must have been from two to three months pregnant at the time of the operation.

Massot mentions a case (159) of fistula, treated by Reybard's forceps or clamp. The patient was three and a half months pregnant, and aborted the night following the operation (the clamp being removed at that time). The continued presence of an instrument in the vagina, irritating the vagina and cervix, may have affected the result. Pregnancy was unsuspected.

Here we have five cases operated upon: two in the second month, two in the third, and one in the fourth. Two aborted; in two there was no union; the rest succeeded, but in two cases after a severe hemorrhage. Hemorrhage more or less severe, once nearly fatal, is mentioned in four of the cases. Such results are not very favorable, and would hardly induce any one to perform the operation during pregnancy, except from the most pressing necessity.

Hemorrhage from operations on the vagina is just what we might expect. The extreme vascularity of the vagina during pregnancy, giving rise to a peculiar bluish color, has often been noticed, and is laid down in the books as one of the cardinal signs of pregnancy. It stands for the red flag of danger.

RECTUM.

Operations on the rectum seem to be somewhat dangerous.

Desprès (104) converted a recto-vaginal fistula into an

ano-perineal fistula in a woman three months pregnant. No bad results followed, and the patient was delivered at term.

Dr. Engelmann is the only one, as far as I can learn, who has boldly advocated operating on a fistula during pregnancy. His case was a large, transverse recto-vaginal fistula, which had previously been operated upon by Dr. Greiner, of St. Louis. As the doctor wished Dr. Engelmann's assistance in the second operation, and as he was about to leave town for a long stay, he advised operating at once, although the woman was between five and six months advanced. "The operation was successful, healed kindly, and was not ruptured in the following delivery, which occurred at term. The patient was a strong, healthy woman, and has remained well since."

Compare this with a case by Dr. Cazin, in which he performed forcible dilatation of the sphincter ani, for fissure of the anus, in a young girl, and where abortion followed quickly, she being in the early stages of pregnancy. A similar case is reported by M. Rey. That abortion does not always follow this operation we learn from a case of Dr. Gayet (102), where he dilated, not only with the fingers, but with the speculum. The woman was five months pregnant, went to term, and was delivered of a healthy child.

Cohnstein relates two cases: one seen by Mauriceau, and the other done by Richet. In Mauriceau's case, the operation for fistula in ano in the eighth month was made, and Richet cut a stricture of the rectum in the third month. In each case the ovum was expelled, and in the first the death of the mother followed. Massot thinks a dose of croton oil given after the operation might be held accountable for the result in Richet's case.

Why there should be such a tendency to abortion in these cases is hard to say, but the facts gathered here should put us on our guard against interference with the lower part of the rectum during pregnancy, especially during the early months.

BLADDER.

The operations on the bladder of which I find reports are not very numerous. Dr. Goodell has used forcible dilatation to relieve irritability of the neck of the bladder a number of times without any harm resulting. Dr. Byford successfully resorted to the same procedure for the removal of a Hodge pessary (open lever?). Dr. Tremain, U. S. A., tells me that he has removed a urethral caruncle in a pregnant woman without any trouble following.

An operation which might be called for at this time is that for stone. This would be demanded not only for relief of the symptoms, but because its presence might prove an obstruction to labor. If small, experience shows that it could be removed by way of the urethra; but if too big to pass easily by this channel, crushing would seem to be the best way of getting rid of it.

McClintock and Phillippe have extracted stones through the urethra in cases respectively at the fourth and seventh months of pregnancy. In neither case were there any bad results. Thomas performed lithotomy on a woman twenty-seven years old, in the fourth month. She went to term. The stone in this case was very large. The woman recovered perfectly, but was delivered of a dead child. This could scarcely have been the effect of the operation.

Massot finds reported three cases of stone extracted through the urethra during pregnancy without any bad results; one was five, one six, and the other seven months advanced. Dr. Reamy writes that he has removed, by cystotomy, in a woman six and a half months pregnant, a double hair-pin. It was incrusted, and resisted efforts at extraction *per urethram*. The incision was left open, and healed spontaneously in a very short time. The woman went to term without any trouble. Massot refers to a case where cystotomy was done by Verneuil in the third month of pregnancy with perfect success. Indications not given.

The dangers of labor with a stone in the bladder are so great that, encouraged by these results, we should certainly operate in every case.

Thus far we have considered only what might be called the accessory organs. The main organ, that which contains the growing ovum, is the one which we should *a priori* be the least inclined to touch. It is the one, however, which has been most subjected to operative proceedings. In this connection I shall treat, not only of the severe operations, but of the minor as well; for, although of very little importance under ordinary circumstances, they may be of great moment if done during the pregnant condition.

UTERUS.

Applications to the Cervix. I have received two communications on this subject from the same city, but containing such diametrically opposite views that, coming as they do from men high in the ranks of the profession, I must present them to the reader side by side.

Dr. H. P. C. Wilson, of Baltimore, writes:—

The most remarkable surgical operation on the neck of the uterus which I have performed was in the case of a woman about forty years of age, mother of eight living children, and several miscarriages. In her last pregnancy she began bleeding from the uterus with the advent of pregnancy, and bled so profusely all the time that, although she was in the hands of two of our best physicians, nothing could be done to arrest it. At six months I was called in to bring on an abortion to save her life. She was so feeble and bloodless that I refused to produce an abortion then, hoping to carry her to term. At seven months I was forced to bring on the abortion to save her life. I did not see her again until last October, when she came to me, stating that she was again pregnant, and wished for an abortion. I refused to operate, and began mopping out the cervical canal with chromic acid, Monsel's solution, and glycerine, and Churchill's solution of iodine, using one application at one time, and another the next. *I passed my mop carefully just within the internal os.* In two months the erosion and varicose condition of the vessels in the cervical canal was cured. The woman has had no bleeding since, is well, and going on naturally to term. I have seen no such case before. We were at a loss to know, in the first instance, where the blood was from, but after I produced the abortion I was certain that

it came from the cervix and cervical canal; and I then stated to the gentleman with whom I was in consultation that if she became pregnant again I would treat her just as I have now described.

This is certainly a very striking case, but *audi alteram partem.*

Dr. W. T. Howard writes: —

In treating the so-called granular erosion about the cervix during pregnancy, in my earlier gynecological practice, in applying carbolic acid, Churchill's tincture of iodine, etc., I have had some three or four cases to cast off the product of conception. I am so entirely satisfied that the abortion was caused by the applications that I now never use them under such circumstances. In my lectures I always warn students never to apply caustics to the cervix in pregnancy, so strong are my convictions of the great danger of producing abortions, notwithstanding the recommendation of high authorities to use them for the purpose of relieving nausea and vomiting.

Dr. Howard cites two cases recently observed in his practice, in one of which abortion was evidently induced by tincture of iodine applied by another physician to relieve a condition resembling, only less severe, the case described by Dr. Wilson. In the other, the uterus was apparently induced to throw off a dead ovum, retained more than three months, by a free application of carbolic acid to the eroded cervix.

Dr. M. O. Jones, of Chicago, has advocated the application of nitrate of silver to the cervix for the treatment of vomiting during pregnancy. He uses the solid stick, and cauterizes the whole vaginal portion of the cervix, not to cure an abrasion, but as a sort of derivative. He reports five cases, all cures.

Dr. Sims gives his approval to this method, and says that it has relieved a number of cases in his hands. It is, I am informed, the standard treatment to-day in the wards of Professor C. Braun, of Vienna. It is in use by many practitioners. Lusk advises a ten per cent. solution to be brushed on the cervix, and makes no mention of any danger of producing an abortion.

My own experience is confined to a few cases. In one I applied pure carbolic acid to the cervix, and just within the external os, in the second month, and this was followed by the expulsion of the ovum. In several cases I have used a strong solution of nitrate of silver without bad results.

If we seek an explanation of the differences in the experiences of various authorities mentioned, may we not find it in the character of the materials applied? Carbolic acid and iodine are highly diffusible substances, as well as violent poisons to all forms of life, especially the lower. If we consider the fetus, in its earlier stages, as belonging to the lower forms, and take into consideration the rapidity with which the agents named are absorbed, especially by denuded or abraded surfaces, we can easily see how continued doses of such a poison as carbolic acid, or one large dose, may, by killing the fetus, cause an expulsion of the ovum. Dr. Howard mentions as his principal agent, iodine and carbolic acid. Dr. Jones uses nitrate of silver, a substance which is not particularly poisonous, and which by its peculiarity of forming insoluble compounds with albuminous bodies is absorbed very slowly, or not at all. But even this latter agent may, and perhaps has, produced abortions. In these cases we must suppose that the result was accomplished by irritating the nerves, and thus exciting uterine action in an organ peculiarly susceptible. To be sure, Dr. Wilson's case is against this theory, but then it must be taken as an exception which proves the rule.

We may class all caustics which, like nitrate of silver, produce only local effects in the same category. If we do, we get an additional argument from the researches of Courty. Speaking of the treatment of granular condition of the cervix, he says, "An indication for the actual cautery exists in every case of granular cervix. It exists exceptionally in pregnancy, for formidable accidents, such as uncontrollable vomiting, appear to be caused or kept up by the granular condition. I have long ago demonstrated, not only the harmlessness and usefulness of cauterization of the cervix with the red-hot iron during pregnancy, but

also the accomplishment of normal parturition in these cases after the use of the cautery." Cohnstein gives as his experience that nitrate of silver is harmless, and considers the potential cautery as without danger, but quotes a case from Broca, where the second application of the hot iron brought on an abortion, with fatal peritonitis.

There are two other methods of treatment applied to the cervix during pregnancy which demand notice. Although not now so much the fashion to apply leeches as it was formerly, still it is practiced to a certain extent, and it is recommended as a preventive of abortion. Tilt speaks of it, and says:—

"Leeches may be very useful in preventing abortion, when it has been repeatedly caused by a severe inflammatory condition of the neck of the womb, with distended varicose veins. Under such circumstances it is well to apply from four to six leeches to the womb, at two or three successive menstrual periods. By so doing I have repeatedly conducted pregnancy to its full term in women who had previously always miscarried."

He quotes Whitehead as abundantly illustrating the utility of this plan. Dr. J. Henry Bennet is also strongly in favor of this plan. Tilt mentions one or two cases where abortion followed, but seems to doubt the causative effect of the leeching, except in one case, where the leeches got into the canal.

Among the methods which have been brought forward for relieving that most distressing complaint, the vomiting of pregnancy, that suggested by the late Dr. E. Copeman, of England, for a time, at least, attracted much attention. It consists in dilating the external os and canal with the finger carried in as far as the first joint, care being taken to avoid going far enough to disturb the integrity of the os internum. Its author considered the method as infallible, and published some striking cases in support of his views. Others reported successful cases, but abortions following its employment were also reported. Dr. J. Marion Sims met with an abortion, but thinks the result came from the woman having the habit of aborting, she having had two miscarriages previously.

With neither of these last two procedures have I had any experience. The treatment of abrasions of the cervix with solutions of nitrate of silver is now so well understood and so frequently practiced that it may be considered as a settled and legitimate therapeutic measure. Most of those who advocate it, however, deem it necessary to put in a word of caution; nevertheless, I have been unable to find a single recorded case where abortion was unquestionably due to this treatment. The application of leeches and of the actual cautery, while they seem not to be dangerous in the hands of their advocates, and may, to a certain extent, be beneficial, are seldom demanded in practice.

Copeman's method is one which requires so much skill and judgment for its application that it can never be safe in the hands of the general practitioner, and will not come into the general use which the enthusiasm of its originator predicted.

Trachelorrhaphy. — One of the most interesting facts in this connection is that Emmet's operation for lacerated cervix may be performed during pregnancy without necessarily interfering with the integrity of the ovum. The first case, which came to my notice, was in my own practice. Mrs. E., multipara, applied for relief at the New York Dispensary, November 9, 1877. She was very weak, suffering so severely as to be scarcely able to walk into the consulting-room. She stated that her last menstruation was on September 20th. On examination I found the cervix exquisitely tender, so much so as to make an examination very painful. The whole cervix was red and denuded, and the seat of a deep bilateral laceration. No satisfactory examination of the body of the uterus could be made, except enough to notice that it was nearly in position and a little enlarged. I explained to her the necessity of an operation for her permanent relief. A month was spent in making arrangements and in preparatory treatment, during which time I made no digital examination. December 10th I operated, Dr. Mundé assisting. The condition of the cervix was greatly improved, but it

was still tender and somewhat denuded. I noticed that the tissues were very soft, and that the hemorrhage was greater than usual. Five sutures were introduced, and during the time that they were in there was a profuse purulent discharge from the vagina, such as I have never before or since seen to follow this operation. Union was complete, and the relief of the symptoms perfect. March 8th she returned to say she was not well, and upon examination I found an ulcer on one side of the cervix, round and deep. This I considered to be chancroidal, as her husband had contracted a chancroid on his glans penis while his wife was in the hospital. This yielded to treatment, and I saw no more of her until the summer, when she came in to say that she had recently given birth to twins. I saw them: they were well-developed children. The cervix was not torn, and only showed a depression on the side where the chancroid had been.

The next case which I met with was in the practice of Dr. Mundé. While attending Dr. Mundé's patients at the Woman's Hospital, out-department, for him, during his absence, I saw Mrs. S., aged thirty, having one child. As the uterus was plainly to be felt in the posterior vaginal pouch, I made the diagnosis of retroversion. Dr. Mundé examined her a few weeks after, and diagnosed probable pregnancy, merely from softness of the cervix and slight enlargement of the uterus. There was a bad bilateral laceration of the cervix. As the uterus did not seem to grow, the idea of pregnancy was given up, and Dr. Mundé operated upon the cervix during July, 1878. Menstruation had been very irregular for some time, and there were no rational signs of pregnancy. The operation was successful, and the stitches were removed, leaving a virgin cervix. Twelve or fourteen days afterward, as Dr. Mundé was again absent, I was called to attend the woman, and delivered her of a three months' fetus, which had evidently been dead for some time. The cervix was again torn by the passage of the child. The woman made a good recovery. Dr. T. A. Emmet operated for a double laceration during the second

month, pregnancy unsuspected. She made a good recovery, went to full term, and had no trouble afterward.

Dr. Reamy also sends notes of a case as follows: —

Mrs. J. B., aged thirty four; married six years; mother of two children, eldest three years, youngest nine months. During her first confinement, which was tedious, and the delivery instrumental, she suffered a severe left lateral laceration of the cervix. Before the second pregnancy occurred, she was placed in my charge. As she was suffering from most of the symptoms which usually follow such conditions of the cervix, I urged an operation. Her husband would not consent. I was surprised to hear of her pregnancy, as the local conditions rendered it improbable. I attended her at confinement. Labor quick and easy, but she remained in poor health, was anemic, and suffered from exhaustive leucorrhea.

I saw her again July 10, 1880. Examination showed erosion of the posterior lip, considerable hypertrophy, and marked induration, especially at the bottom of the laceration, where there was a large cicatricial plug. The laceration was quite extensive, and the erosion more especially of the posterior lip, which bled at the slightest touch. I feared approaching malignancy. An operation was again urged, and cheerfully agreed to. She had not menstruated since her last confinement. There were no signs of pregnancy, and it was scarcely considered. I operated August 3d, and found the bleeding more profuse than usual. Four silver sutures were introduced. Result was perfect. The patient's health improved rapidly, and soon fetal movements were unmistakable. I delivered her of a perfectly developed child, weighing eight pounds, March 18, 1881. Labor natural and easy. The os dilated promptly and safely, and was not torn at all. Labor terminated in three hours after the first pains. The patient must have been in the second month of pregnancy at the time of the operation.

Dr. Goodell says that he performed the operation for a lacerated cervix, unwittingly, on a pregnant woman, who had apparently menstruated a week before; but six days after the operation, a six weeks' ovum forced its way through and tore open the wound.

These, with Dr. Shepherd's case, already reported, make a total of six cases in which the operation was done. In

four the results were perfect in every way, while the other two aborted and tore open the freshly united wound. In my own case, I am sure the sound was not passed, as I forgot to take the instrument with me. It is, I believe, the general custom to pass the sound both before and after the operation, so that it is altogether probable that, in the cases which aborted, the abortion was due to this cause. Dr. Shepherd says that it was twice done, but, curiously enough, no abortion followed.

These cases are of great interest, in that they show what treatment a pregnant uterus will stand without being excited to contraction, provided the interference is confined to the cervix. The only practical deduction which we may make is that if we find a case of "habitual abortion," where the habit evidently depends upon a torn cervix, and where the woman is already pregnant, we may still hope to save the ovum by a careful performance of this operation. The operations were all done in the early months of pregnancy, and, as in the operation on the perineum, union occurred in every case.

Polypi of the Cervix. — Small mucous polypi of the cervix may be twisted or snipped off during pregnancy, and the bleeding points touched with an astringent. Dr. H. P. C. Wilson mentions having done this frequently, and other cases are reported, especially one by Tanner. But this operation, slight as it is, is not devoid of danger. Dr. Lusk met with a case where he snipped off a polypus not larger than a good-sized pea, which protruded from the cervix and caused profuse leucorrhea. The patient was two and one half months advanced in pregnancy. She was seized with pains on leaving the doctor's office, and aborted a few hours afterward.

As showing how these cases can be safely treated, it may be interesting in this connection to mention a case reported by Dr. Horace Williams. A small polypus of the cervix was discovered in the third month of pregnancy. It gave rise to some hemorrhage. The doctor asked the opinion of the Philadelphia Obstetrical Society

as to its removal. The verdict was unfavorable, so he treated it with a strong application of tannin, after which the hemorrhage ceased, and, two months later, no traces of the polypus could be seen.

Large Polypi, which may be mucous, but which are more generally fibroid in character, present a more complicated problem for solution. That these tumors may cause very serious trouble during pregnancy and labor cannot be doubted. Under the influence of the increased nutritive energies which involve the parent organ at this time they often increase very rapidly. During pregnancy, the principal symptom which is indicative of their presence is hemorrhage. The flow may be continuous or periodic, and to this cause may be attributed many of those curious cases of menstruation during pregnancy. If they do not cause any trouble beforehand in labor, they may present an actual obstacle to the passage of the child, or, on being torn off, may cause a considerable hemorrhage of an obstinate character. Again, the extreme and long-continued pressure to which they are subjected may cause their death, with breaking down of the tissues, fetid discharges, absorption, and septicemia.

It becomes, then, our duty, in every case in which such a tumor is discovered during pregnancy, to decide at once as to its removal. We have to balance on the one hand the danger which we may encounter if we remove it, and on the other, the risks of leaving it. Besides the danger to be anticipated in child-bed, the presence of the tumor, either by causing severe hemorrhages or by its mechanical action, may bring on an abortion. On the other hand, interference may provoke abortion, either directly, or by the high temperature following the absorption of septic material from the large suppurating surface likely to be left. This latter danger depends upon the size of its attachments, while the danger of direct abortion depends rather upon their seat. Let us see what have been the results thus far obtained.

Dr. Lusk reports having removed a polypus as large as

an egg from the cervix of a woman seven months advanced, with good results. A periodic flow which had lasted throughout pregnancy ceased after the operation. Dr. Jenks writes that he has met with one case. "It was a cellular polypus, about three inches in length. The woman was in the fourth month of pregnancy, and had been complaining of frequent floodings of late. I found the polypus protruding beyond the os internum, and apparently attached above it, quite a distance. I passed a wire écraseur around it up to the os internum, and removed it without interfering with pregnancy, as she went to full term." Cohnstein has collected fourteen cases. The results were as follows: In two cases, in which the tumor was cut off with scissors, abortion followed at once in one; the other went to full term. Torsion was used three times without abortion. The other nine cases were operated upon by the ligature, and Cohnstein remarks that the results show that in the first three months the operation may not only lead to abortion, but "that fatal peritonitis follows with relative frequency. In the later months the results are favorable both to mother and child." Unfortunately, he gives no figures for these nine cases. We are thus compelled to throw them out, and we may do so the more readily because they were operated by a method now nearly obsolete.

Massot refers to a case (180) by Aston Key, where a tumor as large as a small apple was removed by ligature. It separated with the tumor on the second day. The patient was imprudent, and got up the next day, when pains came on, and abortion followed. Metro-peritonitis set in, and she died on the fourth day after the miscarriage.

West (181) excised a fibrous polypus, as large as a hen's egg, from the anterior lip. The patient was pregnant, made a good recovery, and, six months afterward, was delivered at term. There was some hemorrhage.

We then have nine cases from which to draw conclusions. Of these nine, six were successful. Three of them were in the third month, one in the fourth, and one in the seventh. One of those in the third month miscarried.

Demarquay and Saint-Vel, in writing of fibroids in pregnancy, say there should be certain favorable conditions, one of which is that the tumor should be pediculated and prominent in the vagina (compare Dr. Jenks's case), and also that it promises to be, later, a cause of dystocia. They prefer the écraseur, and add: "The excision of the polypus is the only operation which we ought to take into consideration in cases of metrorrhagia. Besides being radical, it proves less likely to provoke abortion than the tamponade. In the majority of recorded observations of ligature and excision of polypi of the neck, pregnancy has not been interrupted; but since such results have obtained, intervention ought to be only from necessity." As to when the necessity arises, the condition of each case must determine. They refer to two cases where large fibroids of the neck were enucleated during pregnancy. One was by Danyau, in the sixth month. The tumor filled the whole pelvis, and had its seat in the posterior lip. Child dead, and extracted by version; recovery. The other was by Braxton Hicks: a multipara, in labor twelve hours. Large tumor filling the posterior part of the pelvis, situated in the posterior lip of the womb. Enucleation without any hemorrhage; child and mother living. I am unable to present any more cases, but from the few here given it may be seen that, in a case demanding interference, on account of either hemorrhage or threatened abortion, the removal of the polypus will offer a fair chance of relief without danger to the child. Whether every case should be operated upon at once on its discovery, as a precaution against possible danger, we have not the means of deciding. I should give it as my opinion that it would be better to wait, under such circumstances, until later in the pregnancy, but to operate before labor set in. The method of operating which we should choose would be by the galvano-cautery wire.

Cancer of the Cervix. — The questions which interest us in regard to this unfortunate complication of pregnancy are: Should an operation be undertaken in the earlier months, for the removal of the growth? What are the

chances for the mother and child in case an operation is done? What will be the result if it is left alone? The only form of uterine cancer which is liable to exist during pregnancy is that which affects the cervix. In a majority of instances the growth of the ovum is not interfered with. Nor is this so unfortunate as might at first seem, for it has been found that an abortion does not much help matters, and that the mother's life is not greatly prolonged by it. The dangers of abortion are also very great. The treatment, then, resolves itself into the question, Shall we remove the growth in the early stages, or let the pregnancy and the tumor go on together? If pregnancy goes on, it may result in the death of both mother and child, and is quite likely to be fatal to the former. The increase in the nutritive energies of the uterus is generally shared by the tumor (exceptionally it remains quiescent), and it may grow to such a size in a short time as to render the passage of the child impossible. In such a case we are compelled to resort to Cæsarean section, in the interests of the child, the mother's chance for life, under any circumstances, being so small as to be practically of no account. If not an absolute hindrance to labor, it still may cause severe hemorrhage, and induce other complications, which may result in the loss of both lives. Thus there is every inducement to early operation, if this can be done with a fair chance of success. That this can be done without especial danger, and that such practice is good and justifiable, the following cases seem to show.

Dr. C. Godson reports a case in which he removed a large cauliflower excrescence in the sixth month, with the écraseur. The patient, a multipara, went to term, and was delivered of a living child. Two years later she was again confined. A dead child was extracted by version, but the patient died, thirteen days after, of exhaustion.

Dr. Mundé adds two cases to the list: —

Case I. — Mrs. H., aged thirty-four, three children. When seen (1875) she had been flowing for six months. An examination revealed a large cauliflower growth (epithelioma) of the

cervix. The hemorrhage was so profuse on examination that the vagina was immediately tamponed. No bimanual examination was made, on account of the flow. The mass was amputated in two slices by the galvano-cautery wire ; time, twelve minutes. There was no hemorrhage at the time of the operation. On the night of the sixth day after the operation violent pains set in, with hemorrhage, and were followed by the expulsion of a two to three months' fetus. The placenta was retained, and had to be removed by the curette. The patient made a good recovery from the operation and the abortion. Pregnancy was not suspected.

Case II. — Mrs. D., aged forty-one, ten children and four abortions. Had been flowing for three or four months. Flow never profuse. Her general health was good. A vaginal examination showed a soft, very pulpy mass, the size of a large lemon, attached to the posterior lip of the cervix. The anterior lip was healthy. No bimanual examination was made, as the diagnosis of epithelioma was clear, as also the possibility of removing it entirely, at least macroscopically. Pregnancy was not suspected. April 12, 1882, the mass was removed by the galvano-cautery wire, close to the posterior vaginal cul-de-sac. Time occupied in the removal, seven minutes. No hemorrhage. The vagina and cervix looked blue, which was attributed to the presence of the tumor. The patient made a good recovery from the operation. She was examined again on several occasions by the speculum. The last time was June 25th, when the exceedingly blue color of the labia was again noticed. A bimanual examination then revealed the head by ballotment, and the fundus reached nearly to the umbilicus. The motion of the child had been perceptible to the patient for some three weeks. She was evidently five to six months pregnant, and consequently must have been in the third month at the time of the operation. The growth had not reappeared.

Cohnstein has collected four instances where amputation of cancer of the cervix was performed in the earlier months, and in only one did an abortion follow.

Thus we have seven cases, with two abortions, but recovery from the abortion in each case. In no instance was the return of the growth, before the confinement, noticed. This is certainly a very encouraging showing, but unfortunately this method of treatment is applicable to but few cases,

from the fact that the tumor is not apt to be discovered in time. It should lead us, however, in multiparæ no longer very young, to make an examination during pregnancy even for a slight hemorrhage or a persistent discharge, even though the discharge be not offensive. I have now given every case of operation on the pelvic organs during pregnancy, records of which I have been able to obtain. Having no preconceived ideas, no opinions to sustain, I have tried to draw my conclusions in as fair a spirit as possible, and in formulating them shall give only those points which seem to be justified by the facts. The conclusions to which I have come may not seem to others to be the correct ones; but be this as it may, the facts are here, and each one may judge for himself. In looking over the cases, the reader must have been struck by the number of times that pregnancy was overlooked. This was doubtless sometimes due to carelessness, sometimes to the entire absence of all symptoms pointing to the existence of a fetus in utero, and sometimes to the impossibility of detecting pregnancy in its earlier stages.

In adding up the cases for the purpose of taking a general percentage, for the sake of making some comparisons, I have omitted all cases which could not be strictly called operative. Where it is stated that such and such an operation was done several times, I have translated "several times" as twice. In this way I count a total of ninety cases.

If will be observed that in twenty cases (22.2 per cent.) abortion followed the operation, and that four patients died. These results are better than those arrived at by Cohnstein (45.5 per cent. of abortion), where all sorts of operations and injuries were included, and compared favorably with Massot's statistics, — one hundred and thirty-one operations of all kinds, with forty abortions (30.2 per cent.). But it would be hardly fair, therefore, to conclude that operations on the pelvic organs give a more favorable result during pregnancy than operations upon other parts of the body.

Nature of Operation.	Number.	Abortions.	Deaths.
Venereal warts of the vulva	19	3	–
Venereal warts of the vagina	3	–	–
Elephantiasis of the vulva	2	–	–
Sarcoma of the vulva	1	–	–
Lipoma of the vulva	1	–	–
Cyst of the vulva	1	–	–
Abscess of the vulvo-vaginal gland	5	1	1
Unruptured hymen	1	–	–
Polypus of the vagina	4	1	1
Cyst of the vagina	1	–	–
Abscess of the vagina	1	–	–
Stenosis of the vagina	1	–	–
Anterior elytrorrhaphy	1	–	–
Vesico-vaginal fistula	5	2	–
Urethral caruncle	1	–	–
Dilatation of urethra for stone, etc.	5	–	–
Cystotomy	2	–	–
Recto-vaginal fistula	2	–	–
Stricture of the rectum	1	1	–
Fissure of anus	3	2	–
Fistula in ano	1	1	1
Ruptured perineum	7	1	–
Polypus of cervix (small)	3	1	–
Polypus of cervix (large)	7	3	1
Lacerated cervix	6	2	–
Cancer of cervix	6	2	–
	90	20	4

The number of abortions is certainly very small; strikingly so if we throw out operations on the rectum, and cases where the bad result might be properly attributed to causes outside the operation itself. It is really astonishing to find that such operations as those for torn cervix and perineum, or for the removal of large polypi and cancerous growths of the cervix, have such a small per cent. of abortions. If we examine carefully all cases where abortions occurred, we should find that many of them were not directly due to the operations.

The history of the three cases where abortion followed the removal of venereal warts from the vulva are too short to allow of any study. The case where abortion and death followed the opening of an abscess of the vulva will be referred to when considering the deaths. The death fol-

lowing the amputation of a vaginal polypus was not preceded by an abortion, but followed labor at term. The abortion, after a similar operation, lies open to the suspicion of having been caused by the passage of the uterine sound.

The same is true of the two cases of lacerated cervix, and one of ruptured perineum. One of the cases of vesico-vaginal fistula was operated upon by a clamp, which was left in the vagina, and to this, in part at least, the occurrence of the abortion may be attributed.

Four abortions follow five operations on the rectum. The abortion following the excision of a small polypus of the cervix must be attributed to the excessive sensibility of the uterus in this case. Thus more than half of the abortions might perhaps have been avoided, had the operators refrained from operating on the rectum, and had they in other cases been cognizant of the condition of their patients. The remaining cases (a little more than 10 per cent.) must be set down against the operations; but this is a very small proportion, and one which should not cause us much anxiety in case we are called upon to operate during pregnancy. It is generally supposed that severe hemorrhage predisposes to abortion. This, however, is not borne out by the authorities who have studied the subject, and by the histories of these cases. Where the hemorrhage was freest, as for instance in one of Dr. Campbell's cases, there did not seem to be any tendency to abort. Massot comes to this conclusion from the study of a number of uncomplicated hemorrhages, and quotes with approval the conclusion of M. Brume, who says: "The efficacy of hemorrhage as a cause of abortion cannot be admitted without more proof."

The number of fatal cases is hardly larger than would have been probable in a like number of similar operations on non-pregnant women, and is probably less than would have occurred among these same women had no operation been performed upon them at all. One death followed the opening of a vulvar cyst, but could be fairly attributed to the coincident rupture of a cyst in the tube of the ovary.

In Key's case, death from metro-peritonitis followed an abortion, but the latter was apparently due to carelessness on the part of the patient. Nicaise's case is without details; while the fatal result in the case reported by Massot did not occur until labor came on at term. A polypus of the vagina was removed by ligature early in the ninth month, and the resulting ulcer may have had something to do with causing the fatal septicemia.

In all the plastic operations, union by first intention occurred even when a previous operation had failed. Of the case in which the period of pregnancy is stated, there were thirteen before the third month, twenty-six in the third, seven in the fourth, six each in the fifth, sixth, and seventh months, and one each in the eighth and ninth months. More than half the operations, then, were performed in the first four months, the time when abortions are supposed to occur most easily, — a supposition which is supported by the facts; for all the abortions of which the date is given occurred on or before the third month, except two; one of these was in the sixth month, the other in the eighth.

If now we sum up our conclusions in the form of propositions, we may say: —

1. Pregnancy is not so decidedly a bar to operations on the pelvic organs as is generally supposed. The results, however, vary with the operation and the organ operated upon.

2. Union of denuded surfaces is the rule, and the cicatricial tissue formed during the earlier months of pregnancy is strong enough to resist the shock of labor at term.

3. Operations on the vulva involve very little danger either to mother or child.

4. Operations on the vagina are likely to cause severe hemorrhages, but are not otherwise dangerous.

5. Venereal warts and vegetations of large size and non-syphilitic are best treated by removal, whether they occur in the vagina or are confined to the vulva.

6. Applications of nitrate of silver and astringents of this class may be made with safety to the vagina and cervix.

Diffusible poisons, like carbolic acid and iodine, should not be used pure or in strong solutions for such applications.

7. Operations upon the bladder and urethra are not dangerous, or likely to be followed by abortion.

8. Operations on the rectum involving the sphincter ani, even if slight in their character, are dangerous.

9. The operation for vesico-vaginal fistula should not be undertaken during pregnancy, as the dangers of hemorrhage and abortion are considerable.

10. Plastic operations on the cervix and perineum may, if necessary, be undertaken in the earlier months of pregnancy with a fair prospect of success, and with a good chance that the results may not be impaired by labor.

11. Small polypi of the cervix may best be treated by torsion or strong astringents. If cut, there is some danger of abortion following.

12. Large polypi may, if causing hemorrhage, be removed at once, with a fair chance of good results. If not doing any harm, then removal is best left until near the close of pregnancy.

13. Cancer of the cervix discovered during pregnancy should, if possible, be removed at once.

NOTE. — As a great deal more material is necessary in order to decide whether these conclusions are correct, it is earnestly requested that those having notes of cases bearing on the points discussed in this paper will send them to the author.

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